Getting to Know the Parts You Can See

You wouldn't want a surgeon to operate without knowing the pertinent parts of the human body — especially if you're the patient. By the same token, you really shouldn't do surgery on your PC if you don't know what its components are and what they do.

Fortunately, hardware is more modular and less costly today than it was in the "good ole days," so most of the repairs or enhancements you want to make aren't necessarily difficult or highly technical. You just need to understand some basics about your computer's anatomy, and you should be good to go.

Another reason to know these basics: Whether or not you ever need to make repairs, understanding computer physiology should help you get more use out of your PC and make your experience with it less frustrating.

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This chapter isn't the *Gray's Anatomy* of computers; for that, you need a more-in-depth book such as my *Fix Your Own PC* (Wiley Publishing). Think of the chapter as being a form of *CliffsNotes* — just enough to start with — and check out the cross-referenced chapters for more details.

Make a Point: Mice and Other Pointing Devices

A *pointing device* allows you to move a pointer onscreen to work directly with the elements you find there. Your PC may have some combination of the following:

- **Mouse:** This device gives your computer a hand, in a metaphorical sort of way. It's one of the most intuitive elements of a computer, easy to grasp and to use. See Chapter 13 for more on mice. You may have either of two kinds:
  - **Wired:** The most common pointing device is the basic mouse (see **Figure 1-1**), which is about the size of a deck of cards. Its two buttons and long tail (connection wire) make it look vaguely mouselike. Some mice have three buttons or a small scroll wheel on top.
  - **Wireless:** A wireless mouse has no tail; instead, it communicates with the computer via radio-frequency or infrared waves. You need to keep a wireless mouse fed (powered) with batteries.
- **Trackball:** Some users prefer a trackball (see **Figure 1-2**), which is essentially an upside-down mouse. You move the pointer onscreen by spinning the ball.

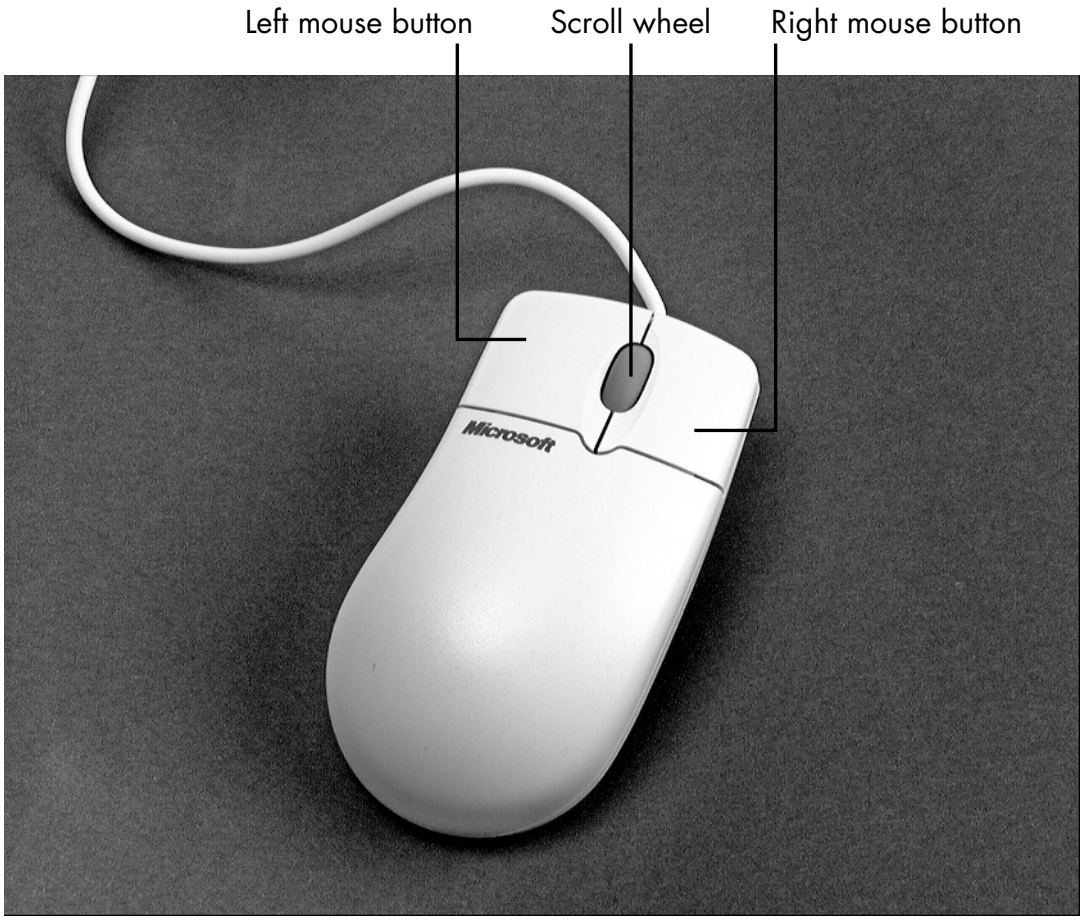

Figure 1-1

The trackball is my preferred pointing device because it doesn't require much desk space and is also easier on the wrist and shoulder than a mouse is.

➠ **Touchpad:** Many PCs feature a touchpad, which is a matchbook-size, touch-sensitive screen on a laptop or a stand-alone device that plugs into a desktop computer. You move the pointer onscreen by pushing your finger along the touchpad.

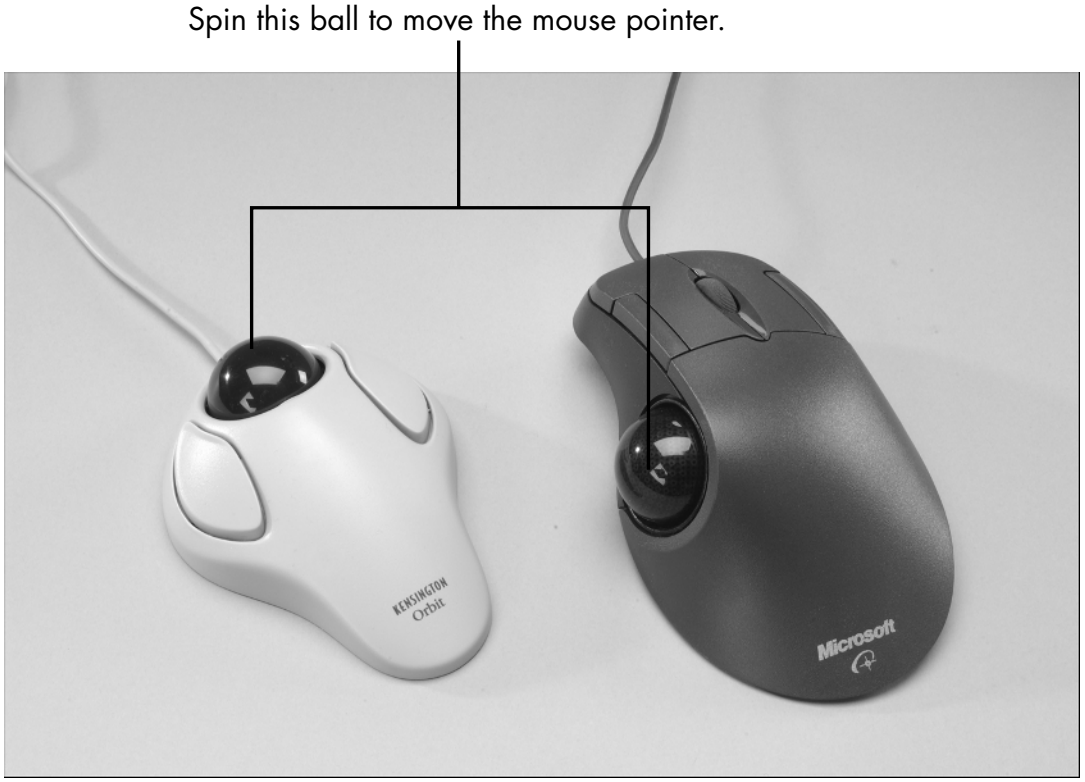

Figure 1-2

Stay on Key: Keyboards and Other Input Devices

- **Keyboard:** The keyboard (see **Figure 1-3**) is the one part of a computer that most of us have dealt with for nearly all of our lives. (Remember the typewriter? Its odd QWERTY layout for the keys is pretty much unchanged.) Like mice, keyboards come in two flavors: wired and wireless. I discuss keyboards in more detail in Chapter 13.

- **Tablet:** A *tablet* is a flat device — an active touchscreen (like that on a GPS receiver or an automated teller machine) or a metal or plastic pad — that allows you to interact with the computer in a way that resembles using a paper tablet or notebook.

Although tablet input devices have been around for a long time, they're still used mostly in high-end graphics stations and by folks who need to input precision drawing or graphics data. If, however, you need to input variable data and just like the concept of using a penlike stylus to interact with your PC, a tablet may be for you.

Figure 1-3

See Clearly Now: Monitors

In this book, for simplicity's sake, I use the terms *monitor* and *display* interchangeably in most descriptions (and cover them interchangeably in Chapter 8). Technically, though, the two devices are different:

➟ **Monitor:** A *monitor* is a high-resolution television display based on a cathode ray tube (CRT). Because of the size of the CRT, it tends to be large and heavy. A modern PC can support two monitors to provide more workspace and to help you separate tasks (see **Figure 1-4**).

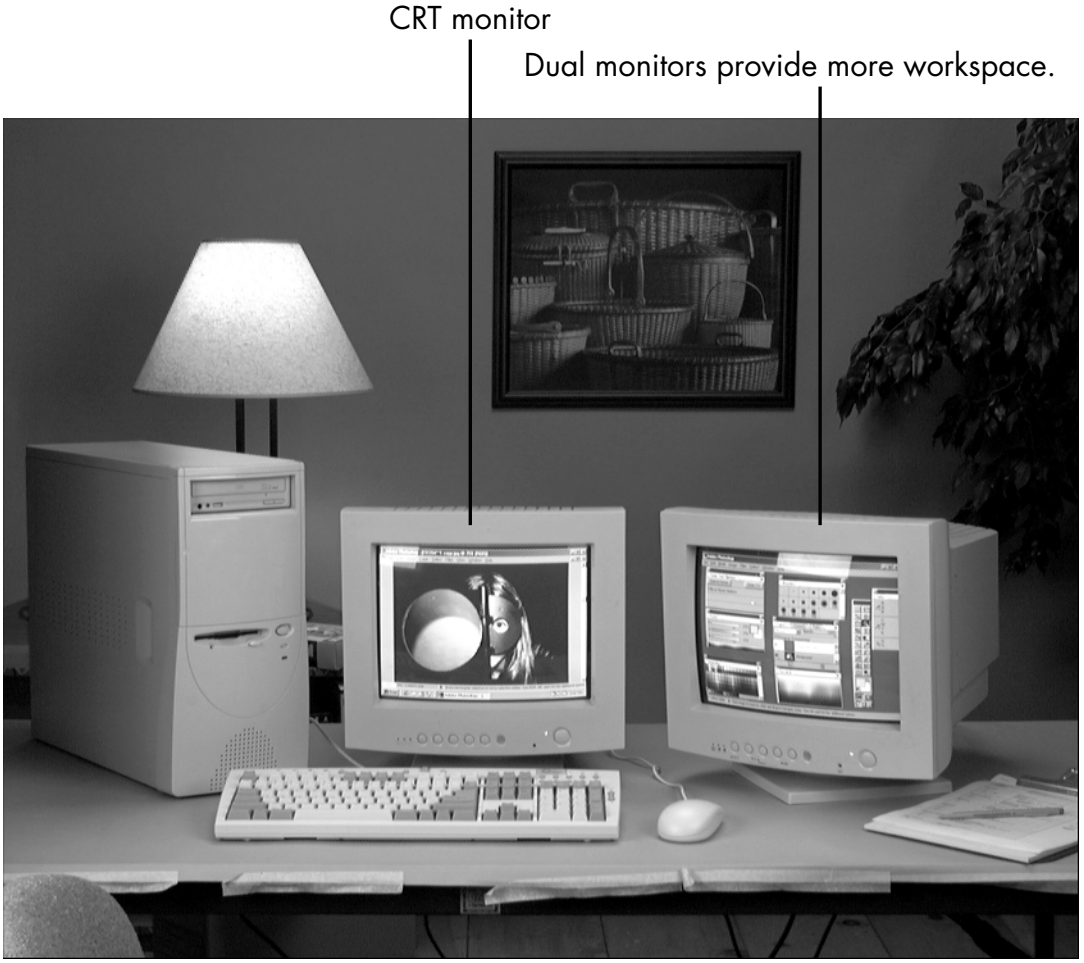

Figure 1-4

A working monitor can be used with most computers. If you buy a new machine or need to replace a failed monitor, however, you'll probably have to switch to a display.

➡ **Display:** A *display* (see **Figure 1-5**) uses a flat liquid crystal diode (LCD) system to show characters and graphics. Displays, which arrived with the first laptops, are thinner and lighter than monitors; use less electrical power; generate less heat; and may be sharper for tired eyes. The newest displays use light-emitting diodes (LED) instead of an LCD system.

LCD and LED displays are thinner and lighter than CRT monitors.

Figure 1-5

Given a choice, I'd get an LED display. LED displays are more expensive than LCD models, but they last longer, use less energy, and run a lot cooler.

Get the Picture (and Sound): Cameras, Speakers, and Microphones

- **Speakers:** Laptop computers generally have little speakers built into their cases; desktop machines offer connectors for external audio equipment. (For more information about these connectors, see "Connect the Parts: Ports and Hubs," later in this chapter.)

To get the best sound from your computer, you should use speakers that have their own amplifier.

- **Microphone:** A computer's microphone (usually built in) allows you to chime in with your own narration or participate in online conference calls. For some users, a microphone can serve as a replacement for, or an enhancement to, a keyboard as a way to enter text and commands.

- **Video camera:** Video cameras for computers, called *Webcams,* are both small (some have a lens the size of the hole in a Cheerio) and inexpensive, so they're built into most laptops today. If you need to add an external Webcam to a desktop PC, you can buy one for $25 to $75. **Figure 1-6** shows a typical display-mounted Webcam from Logitech.

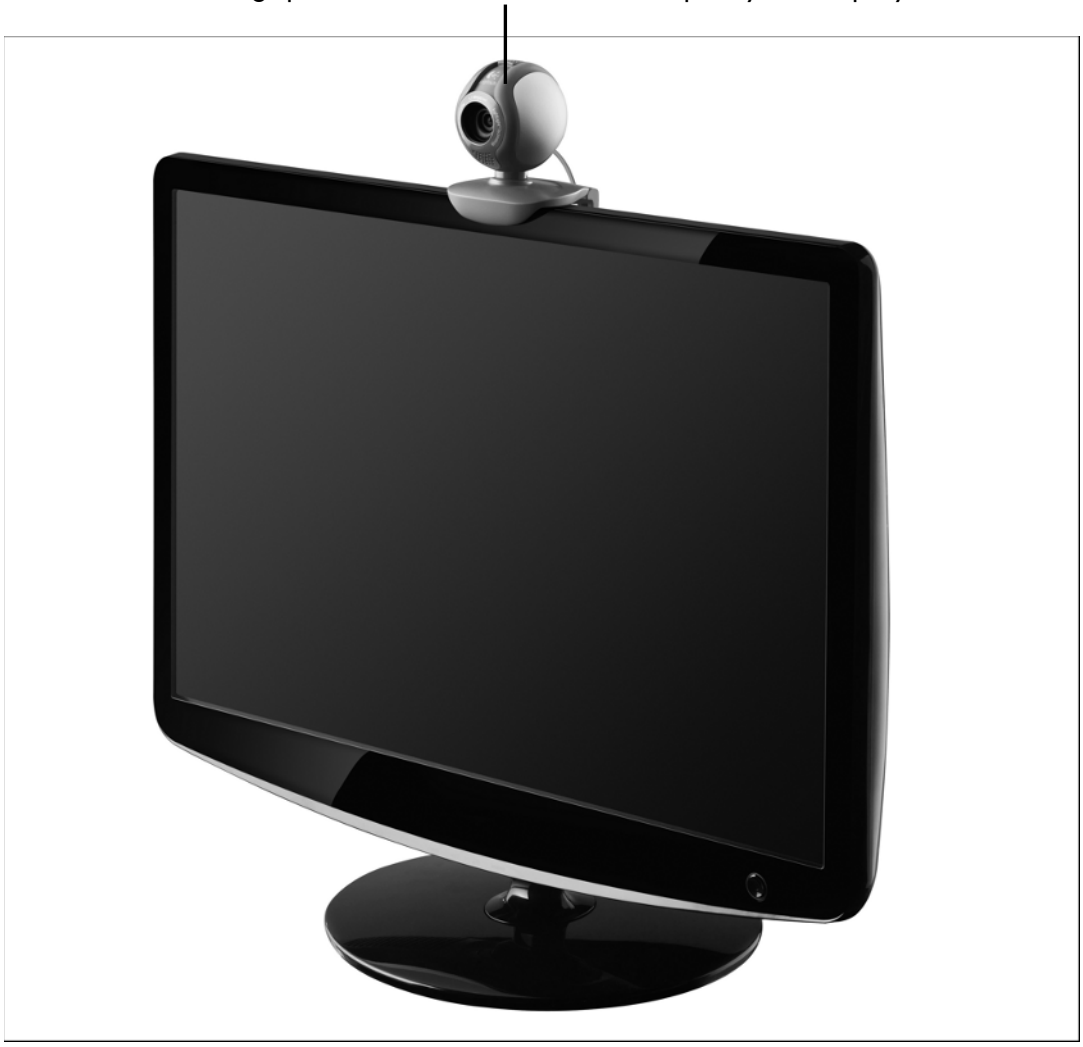

Figure 1-6

Go Online: Modems and Routers

- **Modem:** A *modem* (see **Figure 1-7**) is an essential piece of hardware that allows your PC to communicate with the Internet or with other computers on a local network. It can be either built-in or external. The appearance, features, and speed of your modem depend on what kind of service you use to connect

to the Internet or local network: dial-up or digital subscriber line (DSL) service from the phone company, or broadband cable from a cable television provider. You can find some maintenance and repair tips in Chapter 9.

Figure 1-7

- **Router:** A *router* does what its name says: routes information from your computer across a network and out to the Internet. If you have only a single computer connected to the Internet, you don't need a router; you simply plug your computer directly into the modem. If you want to connect more than one computer to the Internet, however, you need a router to serve as a data traffic cop.

Routers come in many flavors. Some are stand-alone units; others are built into a wireless access point that lets your various computers connect wirelessly to the router and from there to the Internet. **Figure 1-8** shows a modern high-speed wireless router.

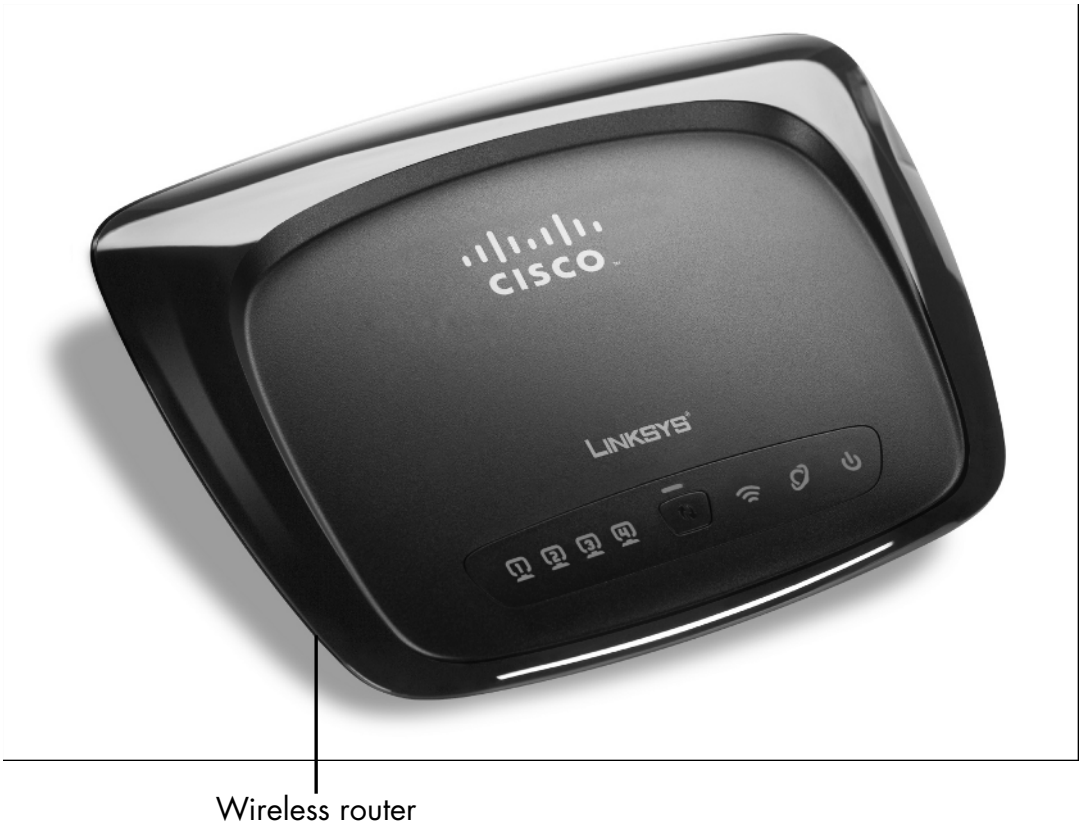

Figure 1-8

Put It on Paper: Printers

- **Inkjet:** Inkjet printers use one or more cartridges filled with ink that literally spray images or text onto paper. Whether the printed information is text or photographs, it consists of tiny dots of ink placed very close together. The advantages of inkjet printers are size and cost — both small. (You can buy

a serviceable inkjet printer for less than $50.) The disadvantages include relatively slow speed and high ink costs. A high-resolution color printer (the type you may use to print photographs) may use four or more ink cartridges, and depending on the amount of printing you do, the cost of maintaining an inkjet printer can be fairly high.

If you're willing to spend more for a high-end inkjet printer, you can get printing speeds of 20 pages per minute (or faster) for black and white and 10 to 30 seconds per page for color. In addition, you can get better picture quality than with a consumer-grade laser printer.

- **Laser:** Laser printers generally cost more than inkjet printers, but they can be faster, and operating costs are lower. A laser printer uses a laser beam to draw characters or images on an electrostatically charged drum, which attracts a very fine powder called toner and deposits the resulting image onto a piece of paper. Finally, the paper is passed through a hot fuser roller that melts the image onto the paper, making it permanent.

- **All-in-one:** For home or small-business use, consider an all-in-one printer (see **Figure 1-9**). These devices incorporate a fax machine, digital scanner, and (usually) inkjet printer in a single package. Prices are reasonable, and the device combination saves desk space. For the greatest flexibility, look for a unit that uses a sheet feeder so that you can scan a stack of pages or send multiple fax pages automatically.

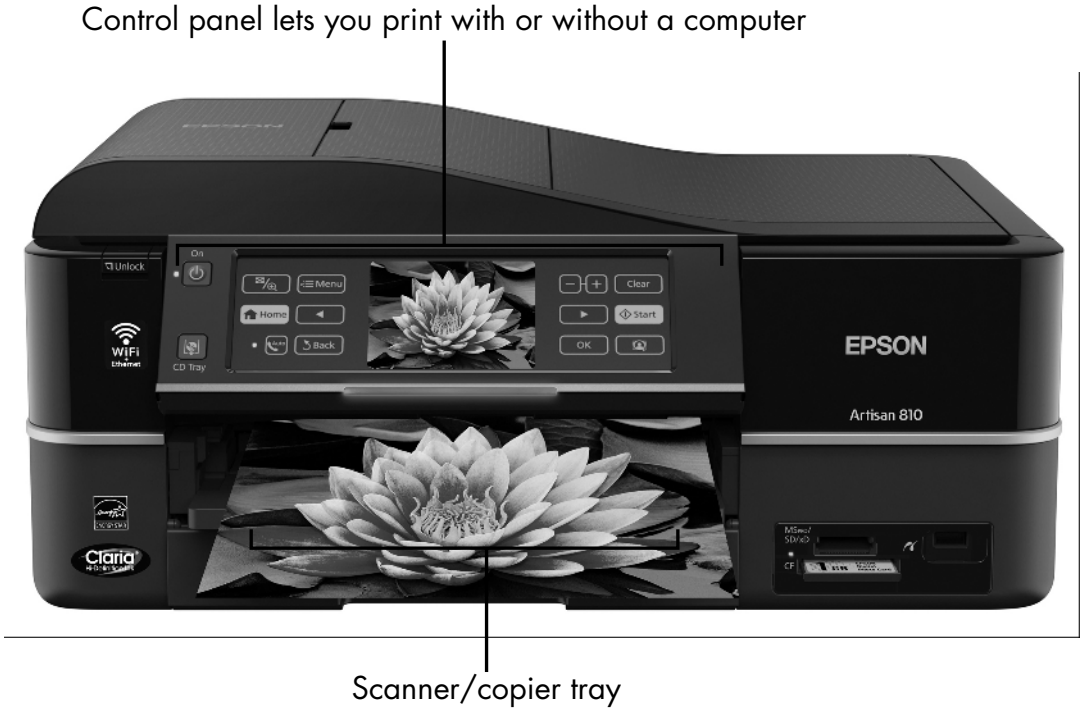

Figure 1-9

Connect the Parts: Ports and Hubs

- **USB (Universal Serial Bus) ports:** These simple rectangular connectors (see **Figure 1-10**) are nearly ubiquitous on modern PCs and laptops because they can be used to link nearly any type of device. A computer may offer a bank of four or six ports, which look like tiny pizza ovens.

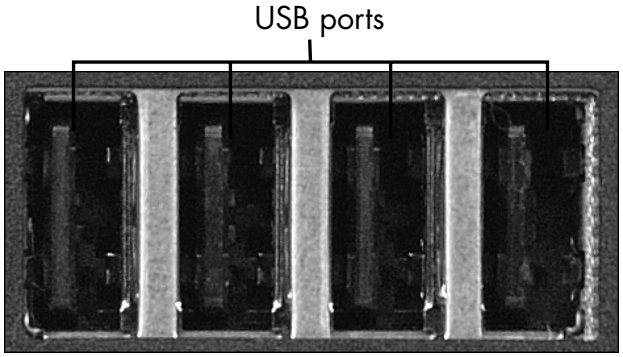

Figure 1-10

The various versions of USB are downwardly compatible with older hardware, so a USB 2.0 port and cable should work with a device designed for USB 1.0, although they will exchange information at the slower speed of the older equipment. When USB 3.0 is available in late 2009 or 2010, it will work with devices designed for USB 1.0 and 2.0, at their original speeds.

- **Ethernet port:** An Ethernet cable plugged into this port attaches the computer to a local area network or high-speed modem. For more on this port, see Chapter 2.

- **Ethernet switch:** An Ethernet switch (see **Figure 1-11**) contains multiple Ethernet ports that connect multiple devices — computers, printers, wireless access points, and so on — to a network.

- **Hub:** Each USB port can connect directly to a single device or can be shared with multiple pieces of electronics by means of a *hub*, which is a bit like the power strip you may have behind your home entertainment system. A USB hub looks and functions much like an Ethernet switch. A cable plugged into a USB port on the PC connects it with the hub, which has two, four, or sometimes more connectors for USB cables.

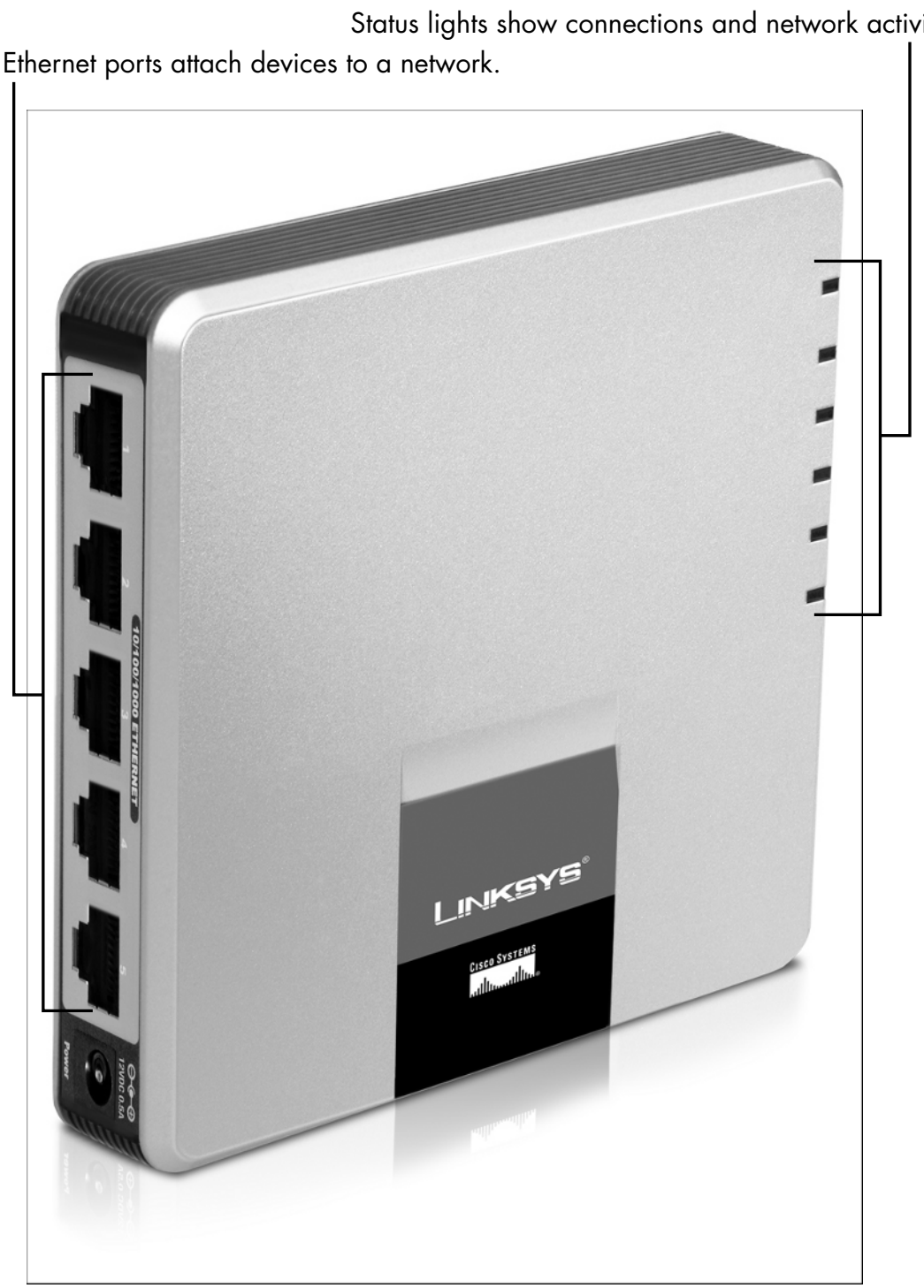
Status lights show connections and network activity.
Ethernet ports attach devices to a network.
10/100/1000 ETHERNET
LINKSYS
CISCO SYSTEMS
Power

Figure 1-11

Protect Your PC: Surge Protectors and UPS Devices

- **Surge protector:** If a jolt of high voltage gets into your computer's motherboard (see Chapter 2), your computer is — to use the technical jargon — *fried*. That's why every computer (as well as any other expensive piece of electronic equipment in your home or office) should have a surge protector between its plug and the wall outlet. This device contains electrical components that can, in most circumstances, chop off any sudden spurts of high voltage.

  In the worst situations, such as a lightning strike or a serious malfunction in an electrical line, a surge protector sacrifices itself like a bodyguard. Its internal parts melt to break the electrical circuit. With luck, this process happens so fast that the electrical surge won't get into the power supply or beyond.

- **Uninterruptible power supply (UPS):** If you want the highest level of protection from a power outage, consider adding a UPS device (see **Figure 1-12**) to your collection of equipment. This device is essentially a large battery with a bit of electronics to control its actions.

  Your computer plugs into the UPS and draws its power from the battery; the UPS plugs into a wall socket, using the electrical current to keep topping off the battery. If the power goes off briefly or drops below ordinary levels momentarily, you should be able to keep on working without an interruption. In the case of an extended power outage, your computer should be able to use the battery long enough to allow you to save any open files and conduct an orderly shutdown.

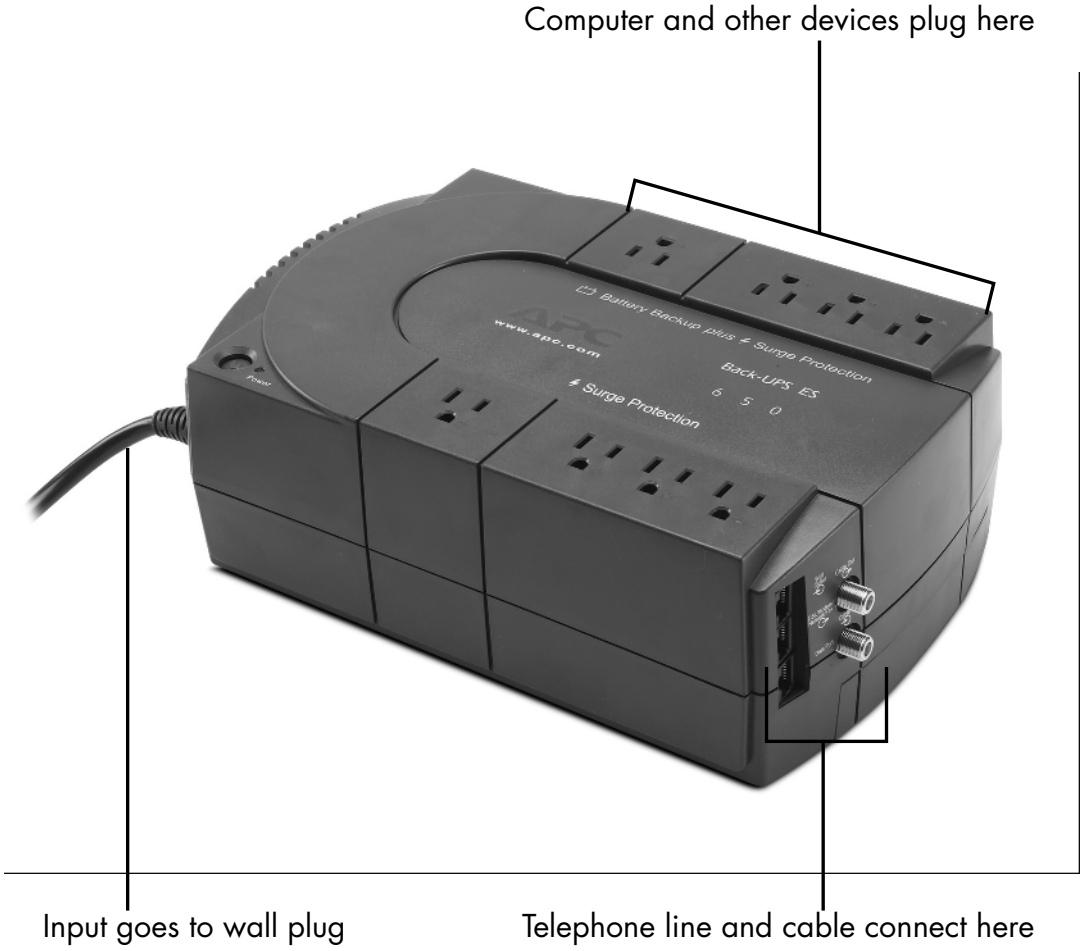

Figure 1-12

Be sure to buy a UPS with a battery large enough to power your computer and its display for a reasonable period, such as 10 or 15 minutes.